



How agro-ecological research helps to address food security issues under new IPM and pesticide reduction policies for global crop production systems

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Abstract:

Drivers behind food security and crop protection issues are discussed in relation to food losses caused by pests. Pests globally consume food estimated to feed an additional one billion people. Key drivers include rapid human population increase, climate change, loss of beneficial on-farm biodiversity, reduction in per capita cropped land, water shortages, and EU pesticide withdrawals under policies relating to 91/414 EEC. IPM (Integrated Pest Management) will be compulsory for all EU agriculture by 2014 and is also being widely adopted globally. IPM offers a 'toolbox' of complementary crop- and region-specific crop protection solutions to address these rising pressures. IPM aims for more sustainable solutions by using complementary technologies. The applied research challenge now is to reduce selection pressure on single solution strategies, by creating additive/synergistic interactions between IPM components. IPM is compatible with organic, conventional, and GM cropping systems and is flexible, allowing regional fine-tuning. It reduces pests below economic thresholds utilizing key 'ecological services', particularly biocontrol. A recent global review demonstrates that IPM can reduce pesticide use and increase yields of most of the major crops studied. Landscape scale 'ecological engineering', together with genetic improvement of new crop varieties, will enhance the durability of pest-resistant cultivars (conventional and GM). IPM will also promote compatibility with semiochemicals, biopesticides, precision pest monitoring tools, and rapid diagnostics. These combined strategies are urgently needed and are best achieved via multi-disciplinary research, including complex spatio-temporal modelling at farm and landscape scales. Integrative and synergistic use of existing and new IPM technologies will help meet future food production needs more sustainably in developed and developing countries, in an era of reduced pesticide availability. Current IPM research gaps are identified and discussed.

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Resource Description

Communication:

resource focus on research or methods on how to communicate or frame issues on climate change;
 surveys of attitudes, knowledge, beliefs about climate change

A focus of content

Communication Audience:

audience to whom the resource is directed

Climate Change and Human Health Literature Portal

Researcher

Other Communication Audience: Farmers

Exposure : ☒

weather or climate related pathway by which climate change affects health

Food/Water Security

Food/Water Security: Agricultural Productivity

Geographic Feature: ☒

resource focuses on specific type of geography

None or Unspecified

Geographic Location: ☒

resource focuses on specific location

Global or Unspecified

Health Co-Benefit/Co-Harm (Adaption/Mitigation): ☒

specification of beneficial or harmful impacts to health resulting from efforts to reduce or cope with greenhouse gases

A focus of content

Health Impact: ☒

specification of health effect or disease related to climate change exposure

Health Outcome Unspecified

Intervention: ☒

strategy to prepare for or reduce the impact of climate change on health

A focus of content

Mitigation/Adaptation: ☒

mitigation or adaptation strategy is a focus of resource

Adaptation

Resource Type: ☒

format or standard characteristic of resource

Review

Resilience: ☒

capacity of an individual, community, or institution to dynamically and effectively respond or adapt to shifting climate impact circumstances while continuing to function

A focus of content

Timescale:

time period studied

Time Scale Unspecified